EXHIBIT I

Page 1

1   IN THE UNITED STATES DISTRICT COURT

2   EASTERN DISTRICT OF TEXAS

3   MARSHALL DIVISION

4

5   ENTROPIC COMMUNICATIONS, LLC,   )

          Plaintiff,   )

6   ) Case No.:

     vs.   ) 2:22-cv-00125-JRG

7   )

     CHARTER COMMUNICATIONS, INC.,   )

8   Defendants.   )

     _____)

9

10

11

12

13   VIDEO-RECORDED REMOTE DEPOSITION OF

14   STEVEN GOLDBERG, Ph.D.EE

15   Cupertino, California

16   Tuesday, August 22, 2023; 7:58 a.m.

17

18

19   TAKEN IN BEHALF OF THE PLAINTIFFS

20

21

22   REPORTED BY:

23   Victoria A. Guerrero, CSR, RDR, RMR, CRR

24   Job No. 6060655

25   Pages 1 through 263

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 1        IN THE UNITED STATES DISTRICT COURT
 2            EASTERN DISTRICT OF TEXAS
 3                MARSHALL DIVISION
 4
 5  ENTROPIC COMMUNICATIONS, LLC,      )
        Plaintiff,              )
 6                          )  Case No.:
        vs.                 )  2:22-cv-00125-JRG
 7                          )
    CHARTER COMMUNICATIONS, INC.,      )
 8     Defendants.              )
    _____)
 9
10
11
12
13
14
15      BE IT REMEMBERED that, pursuant to Federal
16  Rules of Civil Procedure, the deposition of STEVEN
17  GOLDBERG, Ph.D.EE was taken before Victoria A.
18  Guerrero, California Certified Shorthand Reporter,
19  Registered Diplomate Reporter, Registered Merit
20  Reporter, and Certified Realtime Reporter, on
21  Tuesday, August 22, 2023, commencing at the hour of
22  7:58 a.m., the witness responding to questions by
23  videoconference from Cupertino, California; the
24  questions being propounded and proceedings reported
25  remotely via videoconference.
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 4          Tuesday, August 22, 2023
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 8   (No Bates)
 9   Exhibit 2      Opening Expert Report of      48    20
                    Steven H. Goldberg Regarding
10                  Invalidity of US Patent Nos.
                    '775, '690, '008, '826, and
11                  '682 (No Bates)
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13                  through 381260
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22                  (No Bates)
23   Exhibit 9      US Patent No. 9,825,826      162    12
                    (No Bates)
24
25      (EXHIBITS CONTINUE NEXT PAGE.)
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2 (Pages 2 - 5)

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1   A   Yes. It's important -- a person of   14:00:38
2 ordinary skill-in-the-art would read, for example,   14:00:40
3 paragraph 16 where it says, In this respect,   14:00:43
4 embodiments of the invention may be employed in any   14:00:46
5 setting in which a system adapted to perform both   14:00:50
6 signal detection and communications functions is   14:00:54
7 useful such as for commercial and/or civil uses.   14:00:58
8 The invention is not limited to being implemented in   14:01:04
9 any particular setting. Explicit disclosure there.   14:01:06
10   If you follow paragraph 17 it gives more   14:01:12
11 detail about an embodiment, a generic embodiment.   14:01:15
12 Some embodiments of the invention may provide   14:01:21
13 wideband, for example, up to 512 megahertz, or ultra   14:01:24
14 wideband, for example, up to 2 gigahertz,   14:01:28
15 communications capability. And it goes on and I   14:01:30
16 won't read that unless you want me to.   14:01:36
17   And then 18 talks more about   14:01:46
18 implementation. Yeah. So there's a fairly needy   14:01:48
19 section here on talking about what the -- as it   14:01:56
20 says, the range of the particular -- it actually   14:01:59
21 says the invention's not limited to being   14:02:06
22 implemented in any particular setting and it kind of   14:02:10
23 talks about what the range -- what some of the   14:02:13
24 characteristics of that range of settings is.   14:02:15
25   Q   And so it's your opinion that those   14:02:20

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1 sections in paragraph 16 and 17, those constitute an   14:02:23
2 explicit disclosure of the use of the system in   14:02:27
3 connection with the coaxial cable network?   14:02:30
4   A   That was not my testimony at all, no.   14:02:32
5   Q   Okay. So are you saying it's an implied   14:02:36
6 disclosure that this could be used in a coaxial   14:02:39
7 cable network there?   14:02:42
8   A   Well, first of all, it says it could be   14:02:45
9 used in many places. And a person of ordinary   14:02:49
10 skill-in-the-art would understand what different   14:02:54
11 technologies out there are and where they could be   14:02:57
12 used. It gave a little bit more of an example in   14:03:00
13 terms of talking about frequency ranges.   14:03:05
14   And then if I go to my report.   14:03:11
15   Q   Uh-huh.   14:03:23
16   A   I'm going to my report now. Just a moment,   14:03:24
17 please.   14:03:26
18   Q   Sure.   14:03:26
19   A   So if I look at paragraph 248, well,   14:03:50
20 specifically 249, Coyne actually discloses a   14:03:52
21 communication system comprise -- I say, comprises an   14:04:01
22 analog-to-digital converter, a channelizer, and at   14:04:05
23 least one circuit. Coyne -- in paragraph 7.   14:04:08
24   Coyne further instructs that, quote, the   14:04:11
25 analog-to-digital converter receives an analog   14:04:13

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1 signal input and produces a digital representation   14:04:17
2 of the analog signal -- the analog input signal.   14:04:20
3   Coyne teaches these -- also teaches the use   14:04:25
4 of a channelizer in the system that, quote, receives   14:04:27
5 the digital representation of the analog input   14:04:31
6 signal and produces a plurality of digital output   14:04:34
7 signals. Each digital output signal representing a   14:04:37
8 frequency band within a band within the analog   14:04:40
9 signal.   14:04:44
10   You know, Coyne discloses that. And I can   14:04:45
11 go on with all of the other limitations that I talk   14:04:47
12 about. So I talk in each limitation what Coyne   14:04:51
13 actually discloses related to the limitations in the   14:05:03
14 '008.   14:05:08
15   Q   Okay. We'll keep working through there.   14:05:13
16 So first, staying there at 2, which is above   14:05:14
17 paragraph 250, you see there's a reference to a   14:05:18
18 plurality of television channels; do you see that?   14:05:22
19   A   I'm sorry. Where are you pointing?   14:05:26
20   Q   Yeah. It's element 2. So it's system   14:05:28
21 comprising, then you get to 1A. An   14:05:30
22 analog-to-digital converter operable to digitize and   14:05:32
23 a received signal spanning an entire television   14:05:36
24 spectrum comprising a plurality of television   14:05:38
25 channels; do you see that?   14:05:42

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1   A   I do.   14:05:45
2   Q   And can you tell me where it is in Coyne   14:05:46
3 there's an explicit disclosure of a plurality of   14:05:49
4 television channels?   14:05:51
5   A   Okay. Well, first of all, Coyne says it   14:06:04
6 can be used in any application.   14:06:13
7   Second of all, I'll come down, so in 251 I   14:06:15
8 talk about, Coyne teaches that a device called a   14:06:20
9 combiner combines incoming radiofrequency signals,   14:06:23
10 which are analog signals, to a wideband or ultra   14:06:27
11 wideband spectral space and outputs them to an   14:06:30
12 analog-to-digital converter.   14:06:34
13   This converter provides a digital   14:06:36
14 representation of the combined signal to the   14:06:38
15 channelizer which converts, that is demultiplexes,   14:06:42
16 that digital signal into one or more channel   14:06:46
17 outputs.   14:06:49
18   Then I go on. This channelizer outputs to   14:06:50
19 a digital signal spanning an entire television   14:06:53
20 spectrum, quote/unquote. Per Coyne, if channelizer   14:06:55
21 240 is used to generate multiple channel outputs,   14:07:03
22 each may span a desired portion of the entire   14:07:06
23 frequency -- entire frequency spectrum of interest.   14:07:09
24   Coyne also discloses this channelizer has a   14:07:14
25 filter bank in which each filter possesses a pass   14:07:17

40 (Pages 154 - 157)

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1 doesn't say anything about ESPN, right?   14:14:08
2   So, likewise, there, does Coyne ever say   14:14:10
3 anything about television explicitly anywhere? Does   14:14:12
4 it use the word "television" anywhere?   14:14:19
5   A   Let me go to Coyne. Coyne is which one?   14:14:23
6   Q   Yeah. You can look. I want to clarify the   14:14:34
7 record, too. So I marked for the record as   14:14:36
8 Exhibit 8 the '008 patent, Exhibit 9 is the '826   14:14:39
9 patent, Exhibit 10 is Coyne, Exhibit 11 is   14:14:42
10 Caporizzo, and Exhibit 12 is Narita. But that's not   14:14:45
11 for you.   14:14:50
12   (Exhibit 9, US Patent No. 9,825,826 (No   14:14:51
13   Bates), was marked.)   14:14:52
14   (Exhibit 11, US Patent No. 5,874,992   14:14:53
15   (Caporizzo) (No Bates), was marked.)   14:14:56
16   (Exhibit 12, US Patent No. 7,528,888   14:14:58
17   (Narita) (No Bates), was marked.)   14:14:58
18 BY MR. SHIMOTA: 14:15:09
19   Q   Do you remember my question?   14:15:09
20   A   I do.   14:15:10
21   Q   Are you using the search function to search   14:15:11
22 through Coyne for "television"?   14:15:15
23   A   I am. Absolutely. Faster for you.   14:15:17
24   Q   Totally.   14:15:20
25   A   I feel your pain. I understand.   14:15:21

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1   So I did a search for "television." I   14:15:22
2 didn't see it. But as I will not read it again and   14:15:24
3 again, but I read you several paragraphs from Coyne   14:15:29
4 that talked about the wide range of commercial   14:15:32
5 applications that it envisions. And I didn't see an   14:15:35
6 explicit term of TV. But it talked about a very   14:15:40
7 wide range of signals.   14:15:44
8   And a person of ordinary skill-in-the-art   14:15:47
9 would understand television is structured that way.   14:15:49
10   Q   Structured what way?   14:15:55
11   A   In terms of channels.   14:15:57
12   Q   Like television, content, TV and things?   14:16:00
13 Does it describe anything about, like, consumers? I   14:16:03
14 see where it describes consumer applications.   14:16:07
15   Does it describe any -- does it describe   14:16:11
16 with specificity anywhere a consumer application of   14:16:13
17 the Coyne invention?   14:16:15
18   A   Well, I'm going back. And remember, I took   14:16:18
19 you to paragraph 17 which directly followed,   14:16:22
20 obviously, paragraph 16. 16 was this invention is   14:16:32
21 not limited to being implemented in any particular   14:16:36
22 setting. Then it goes on to kind of characterize   14:16:39
23 with a different view what kind of settings might it   14:16:44
24 be relevant to.   14:16:47
25   And we know what Coyne does. You know,   14:16:49

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1 it's got a channelizer, et cetera, et cetera. And   14:16:55
2 then it talks about the frequency ranges that aren't   14:16:58
3 military, that are commercial, and are other, and   14:17:02
4 talks about those frequency ranges.   14:17:06
5   So there's pretty good guidance that it   14:17:08
6 would be applicable for TV or cable.   14:17:11
7   Q   Well, are those frequency ranges like --   14:17:14
8 I'm sorry. Finish your answer.   14:17:17
9   A   To a person of ordinary skill.   14:17:19
10   Q   Are those frequency ranges exclusive to   14:17:21
11 cable networks, are the only applications that use   14:17:24
12 those frequency ranges?   14:17:28
13   A   Well, there's -- I understand the question.   14:17:32
14 And the appropriate answer would be, you know, you   14:17:36
15 can have a cable that uses those frequencies and you   14:17:43
16 can wirelessly transmit them. You can have those   14:17:47
17 frequencies modulated on an optical carrier, you can   14:17:52
18 use those frequencies in multiple places. That   14:17:57
19 concept of band of frequencies.   14:18:00
20   Q   Right.   14:18:03
21   A   But keep in mind what Coyne does and what   14:18:03
22 the '008 does.   14:18:06
23   Q   Right. But those frequencies, are those   14:18:09
24 frequencies actually used in commercial applications   14:18:12
25 wirelessly?   14:18:15

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1   A   Yes.   14:18:18
2   Q   And are those frequencies used in actual   14:18:21
3 applications over optical transmission media?   14:18:23
4   A   In terms of modulation band, yes.   14:18:27
5   Q   All right. And let's take a look at -- you   14:18:30
6 point in your report to figure 2. You can look at   14:18:35
7 figure 2, but in your report you show that there.   14:18:37
8   A   I've got figure 2 open in Coyne. I have to   14:18:43
9 look sideways, but I can see it.   14:18:46
10   Q   And it's underneath paragraph 250 of your   14:18:48
11 report.   14:18:51
12   A   Okay. Well, I'll go to my report, then.   14:18:55
13   Q   Either way. Same difference. On the far   14:18:57
14 left side you see the little triangles labeled 205A,   14:19:04
15 205B, 205 -- correct, see those?   14:19:11
16   A   I do.   14:19:16
17   Q   Are those antennas?   14:19:16
18   A   Yes. That's meant to represent an antenna.   14:19:18
19 The POSITA would see that as an antenna.   14:19:24
20   Q   Right. And this embodiment, that's a   14:19:28
21 wireless embodiment, right? The data received is   14:19:30
22 coming over a wireless channel, correct?   14:19:34
23   A   Okay. Yeah. Paragraph 21 of Coyne in the   14:20:00
24 example shown, receiver adapter 201 includes   14:20:05
25 combiner 220 which receives incoming radiofrequency   14:20:09

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1   Q   There you state, I note that the   15:34:42
2 specification of Zhang does not use the term "mixer"   15:34:43
3 in connection with its frequency block down   15:34:45
4 converter, such as frequency block down converter   15:34:48
5 210 depicted in figure 2.   15:34:53
6   In my view, however, a POSITA would have   15:34:55
7 understood that down converter 210, in the   15:34:57
8 architecture taught by Zhang, would be implemented   15:35:00
9 as a mixer, which was well-known -- which was a   15:35:03
10 well-known technique for down converting RF signals   15:35:05
11 at the time of Zhang, and well before the alleged   15:35:09
12 priority date of the '362 patent; do you see that?   15:35:13
13   A   I do.   15:35:17
14   Q   Were there other techniques aside from   15:35:18
15 mixers for down converting at the time of Zhang?   15:35:20
16   A   Let me go back and look at the priority   15:35:29
17 date of Zhang.   15:35:31
18   Yeah, around 250. Yeah. So -- so the '362   15:35:42
19 patent claims the date of priority April 17, 2009.   15:35:49
20 Okay. That gives us a general range. So the   15:35:56
21 question is, if you're asking me a technical   15:36:01
22 question in general, not related to Zhang, but in   15:36:07
23 general, and I want to be very clear here, that a   15:36:11
24 person of ordinary skill-in-the-art reading Zhang -- 15:36:14
25 which paragraph did you take me to, by the way? It 15:36:17

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1 was three --   15:36:21
2   Q   319. And my question is, let's start   15:36:22
3 there, at the time frame you talked about, were   15:36:24
4 there other techniques aside from mixers that could 15:36:28
5 be used for down conversion?   15:36:31
6   A   No. I want to point out a couple of   15:36:37
7 things. Zhang has an analog front end which means   15:36:38
8 the boxes to the left -- the box to the left of the 15:36:44
9 analog-to-digital converter.   15:36:48
10   There really weren't many -- I'm really   15:36:52
11 scratching my head because I worked in this area for 15:36:59
12 decades. And I actually designed block down   15:37:02
13 converters in multiple jobs as an engineer, as a   15:37:06
14 person of ordinary skill-in-the-art, and especially 15:37:11
15 in satellite systems.   15:37:13
16   A block down converter always used a mixer. 15:37:14
17 If you ask me a more broad question, are there other 15:37:18
18 techniques that can down convert signals independent 15:37:22
19 of whether it's analog or digital? That's a very   15:37:26
20 different question.   15:37:31
21   But we're talking about something to the   15:37:31
22 left of the A-to-D converter in Zhang which means   15:37:34
23 it's analog.   15:37:37
24   Q   Okay. In the analog domain, were there   15:37:40
25 other techniques other than using a mixer to down   15:37:44

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1 convert at the time of the '362 patent?   15:37:46
2   A   Well, what I said was -- let me see here. 15:38:48
3 I talk about it paragraph 329 and I reference   15:39:11
4 another piece of art which actually shows the mixers 15:39:14
5 doing the down conversion. It's not the question   15:39:16
6 you asked and I'm going to answer it here.   15:39:20
7   Q   Correct.   15:39:23
8   A   I guess what I would say, I see my report. 15:40:56
9 And as a person of ordinary skill-in-the-art or one 15:40:58
10 of greater ordinary skill-in-the-art, I say in 391, 15:41:00
11 In my view, however, a POSITA would have understood 15:41:04
12 that a down converter 210, in the architecture   15:41:08
13 taught by Zhang, would be implemented as a mixer,   15:41:11
14 which was well-known.   15:41:14
15   And that "well-known" doesn't even begin   15:41:17
16 to -- it's like I didn't say inherent, I didn't use 15:41:20
17 that word. I said would understand it was   15:41:29
18 well-known.   15:41:30
19   I mean, it's the first thing that comes to 15:41:31
20 mind. When you say block down converter you think   15:41:33
21 of a local loss leader in a mixer. If you were a   15:41:36
22 person of ordinary skill-in-the-art in that time,   15:41:39
23 which I was, and I was for many years, so I stand by 15:41:40
24 my statement.   15:41:46
25   You're asking me -- and I didn't prepare   15:41:47

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1 this for -- because if you look at my opinion, I   15:41:49
2 didn't prepare exhaustively where there's some   15:41:52
3 esoteric down conversion techniques that weren't   15:41:57
4 mixers. I didn't make that statement. And I didn't 15:42:00
5 prepare that for this deposition.   15:42:04
6   But I would strongly state that when you   15:42:07
7 use the term "block down converter," it was   15:42:10
8 strong -- it would be understood as a mixer. And   15:42:14
9 that's what I said.   15:42:22
10   Q   I'm sorry if I cut you off. Are you   15:42:23
11 finished?   15:42:24
12   A   I just say that's what I say in my report 15:42:25
13 in paragraph 391. And then an example -- I'm sorry. 15:42:27
14 I gave an example of this other art, the US Patent 15:42:31
15 Application Publication 089 by Li discloses a   15:42:42
16 receiver and it shows a mixer. It's very common, it 15:42:48
17 understates it. You know, almost universal except   15:42:53
18 maybe in university labs or something where they do 15:43:00
19 something different.   15:43:03
20   Q   Are you done?   15:43:10
21   A   I am.   15:43:10
22   Q   I just want to be clear. What I understood 15:43:11
23 you to say is in 391 you're not arguing that a --   15:43:12
24 that the disclosure of a down converter means   15:43:17
25 that -- that it's inherent, then; that there had   15:43:20

52 (Pages 202 - 205)

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1 been a mixer, right? You're not making that   15:43:23
2 argument?   15:43:25
3   A   I didn't use the word "inherent" in my   15:43:25
4 report.   15:43:28
5   Q   Well, are you making that argument that   15:43:29
6 it's inherent?   15:43:31
7   A   If you listen to what I said, I said   15:43:32
8 overwhelmingly. Well-known is -- I said   15:43:35
9 "well-known" in my report and I'm adding now that   15:43:41
10 it's overwhelmingly understood by people of ordinary 15:43:45
11 skill. If you say a block down converter, you're   15:43:49
12 talking about the use of a mixer.   15:43:52
13   Even though I understand that if I do a   15:43:54
14 search on -- if I go to Zhang and I do a   15:44:00
15 search on --   15:44:06
16   Q   Why is that different than inherent, that   15:44:14
17 it's exceedingly well-known?   15:44:16
18   A   Well, I understand that -- and we can go to 15:44:24
19 my report. Inherent is a very strong statement that 15:44:25
20 it's inherently there. It's necessarily there.   15:44:28
21   Q   You're right. That's a hundred percent   15:44:32
22 correct.   15:44:33
23   A   Thank you. My attorneys taught me well. I 15:44:34
24 think that's what's in the section. What I'm saying 15:44:41
25 here, and what my report says, a person of ordinary 15:44:43

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1 skill-in-the-art looking at this reference would   15:44:46
2 understand that a mixer would be used.   15:44:49
3   Q   Right. But you wouldn't necessarily have   15:44:55
4 to use a mixer. You're just saying it would be   15:44:57
5 exceedingly well-known?   15:44:59
6   A   I'm telling you here if you didn't use a   15:45:01
7 mixer, I don't know what you use. Sitting here   15:45:03
8 today, I don't know what else you would use.   15:45:05
9   Q   Could you use a multiplier?   15:45:08
10   A   A multiplier and a mixer are -- so   15:45:10
11 multipliers -- okay. Great question. And I can   15:45:16
12 give you an answer.   15:45:21
13   A mixer produces a multiplying function.   15:45:24
14 So a mixer does a multiplication. It multiplies the 15:45:29
15 two signals together. Now, it turns out it does   15:45:33
16 other things. But if you want to -- in my mind as a 15:45:39
17 person of ordinary skill-in-the-art, if you said   15:45:42
18 analog multiplier, that gets implemented as a mixer. 15:45:44
19   Q   Okay. Could you use a Hall effect sensor? 15:45:49
20   A   I didn't come prepared to talk about that. 15:45:58
21 I've heard the term before -- like I said, if you're 15:46:00
22 trying to push me into a corner to say -- and I was 15:46:08
23 very clear about this.   15:46:11
24   I said in the Zhang application with a   15:46:12
25 block down converter for the applications that he's 15:46:15

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1 talking about, it's almost always a mixer. And I   15:46:18
2 said I didn't know what it would be if it wasn't.   15:46:22
3 And if you come up with some esoteric like a Hall   15:46:25
4 effect sensor, I don't ever remember in all the   15:46:29
5 companies I've seen, in all the receivers I've seen 15:46:34
6 over my 50 years have I ever seen that used.   15:46:37
7   Q   Could you use an analog circuit to   15:46:42
8 implement a discrete Fourier Transform to perform   15:46:44
9 the down converting function?   15:46:46
10   A   Remember, we're in the analog domain.   15:46:50
11   Q   Right. Could you use an analog circuit to 15:46:54
12 implement a discrete Fourier function?   15:46:58
13   A   Would you use an analog circuit to do   15:47:00
14 a Fourier Transform?   15:47:04
15   Q   Correct. Yes. Sorry. I misspoke.   15:47:06
16   (Reporter requests clarification.)   15:47:07
17   THE WITNESS: First of all, I think that's 15:47:16
18   a non sequitur question. Because, could you   15:47:30
19   use one? I don't know in what -- I didn't come 15:47:34
20   prepared to talk about that.   15:47:38
21   I mean, I know exactly what a Fourier   15:47:39
22   Transform is, but I didn't come here today   15:47:41
23   prepared to do engineering on the Zhang   15:47:44
24   circuit. I'm just telling you what I stated in 15:47:47
25   my report and I stand by my report. Let me   15:47:49

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1   just go back here.   15:48:00
2   It was paragraph, which one we said?   15:48:25
3 BY MR. SHIMOTA: 15:48:26
4   Q   391.   15:48:27
5   A   I say I note that the specification of   15:48:32
6 Zhang does not use the term "mixer" in connection   15:48:34
7 with its frequency block down converter, such as   15:48:37
8 frequency block down converter 210 depicted in   15:48:40
9 figure 2.   15:48:43
10   In my view, however, a POSITA would have   15:48:44
11 understood that a down converter 210, and I will   15:48:47
12 add, in the content of the Zhang patent, in the   15:48:52
13 architecture taught by Zhang, would be implemented 15:48:55
14 as a mixer, which was a well-known technique for   15:48:57
15 down converting RF signals at the time of Zhang and 15:49:01
16 well before the alleged priority date of the patent. 15:49:04
17 I stand by that statement.   15:49:07
18   Q   Right. And I think your testimony just was 15:49:10
19 it would almost always be implemented as a mixer in 15:49:13
20 Zhang, but you're not -- as I understand it, you're 15:49:16
21 not prepared to testify today that it would   15:49:18
22 necessarily always be implemented as a mixer, right? 15:49:22
23 You're just not ready, you don't know this esoteric 15:49:24
24 thing?   15:49:28
25   A   I didn't prepare in this report if it was   15:49:29

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1 some other esoteric thing that could do that. And I   15:49:30
2 didn't say that in my report.   15:49:33
3   Q   Right. Okay. So you're just -- you're   15:49:35
4 saying it likely would be, but you're not saying it   15:49:35
5 would necessarily have to be a mixer in the   15:49:37
6 architecture of Zhang, correct?   15:49:41
7   A   Yeah. I've said it in other places in the   15:49:43
8 report. If I meant inherent necessarily, I would   15:49:46
9 have said it. I didn't say that.   15:49:48
10   Q   Gotcha. Fair enough. That's all. Let's   15:49:50
11 go to 392.   15:49:53
12   A   Can we take a ten-minute break?   15:49:56
13   Q   Sure.   15:49:58
14   A   Thank you.   15:49:59
15   THE VIDEOGRAPHER: Going off the record.   15:50:00
16   The time is 3:50 p.m.   15:50:01
17   (Off the record.)   15:50:03
18   THE VIDEOGRAPHER: Back on the record.   15:59:59
19   The time is 4:00 p.m.   15:59:59
20 BY MR. SHIMOTA: 16:00:04
21   Q   Welcome back. Can I direct your attention   16:00:04
22 to paragraph 374, please?   16:00:07
23   A   May I please add one piece of information   16:00:08
24 to my testimony, please?   16:00:10
25   Q   Sure.   16:00:11

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1   A   You had asked me about a multiplier and   16:00:12
2 that triggered my thinking. If you go back to   16:00:14
3 Zhang, column 3, lines 30 to 40 -- and we actually   16:00:18
4 looked at this and talked about. It says, More   16:00:31
5 specifically, the multichannel analog RF signal is   16:00:33
6 multiplied by a reference signal to a lower   16:00:35
7 frequency.   16:00:38
8   So to me, at a minimum, what this does is   16:00:39
9 rules out anything that doesn't do a multiplication   16:00:43
10 function. Now, keep in mind, and a POSITA would   16:00:48
11 know this, multipliers are typically used at much   16:00:52
12 lower frequencies. They just multiply signals   16:00:55
13 together.   16:00:59
14   The way signals are multiplied in the   16:00:59
15 mainstream low-cost commercial industrial world is   16:01:02
16 using mixers. You get the multiplication function.   16:01:07
17 You get other things. The mixer is a non-linear   16:01:13
18 device. It doesn't give you only the sum and   16:01:16
19 difference or the multiplied signal -- well, it   16:01:17
20 gives you the multiplied signal.   16:01:20
21   It doesn't give you always the   16:01:21
22 down-converted signal and the up-converted signal.   16:01:22
23 It gives you other things which need to be filtered   16:01:25
24 out.   16:01:28
25   So I just want to point out that as strong   16:01:29

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1 as I was about that it needs to be -- that it's a   16:01:32
2 mixer, it's even stronger reading that section of   16:01:35
3 column 3. It rules out anything that doesn't do   16:01:41
4 multiplication in the analog domain which is   16:01:43
5 overwhelmingly done as a mixer.   16:01:47
6   Q   Right. That doesn't change your opinion --   16:01:51
7 that doesn't change your opinion that there's no   16:01:53
8 inherency there, correct?   16:01:55
9   A   But it -- yes. But it basically takes it   16:01:57
10 to -- infinitesimally in that -- you know, to an   16:02:00
11 infinitesimal distance to that.   16:02:05
12   Q   So you're not --   16:02:10
13   A   As I understand the law.   16:02:11
14   Q   And you haven't considered whether there's   16:02:17
15 anything that could have been used in combination   16:02:18
16 with the multiplier to perform that function or   16:02:19
17 whether the multiplier does that function on its   16:02:22
18 own?   16:02:25
19   A   You're just repeating what I said.   16:02:26
20   A mixer does the multiplication function at   16:02:27
21 frequencies that Zhang talks about. You really   16:02:30
22 wouldn't talk about an RF component as a multiplier.   16:02:37
23 It doesn't multiply a function.   16:02:40
24   But if you look in data sheets at the time   16:02:42
25 of this patent, and you look in the marketplace, to   16:02:43

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1 do this function, you look at mixers.   16:02:47
2   Q   Is there anything else you would look at to   16:02:53
3 do that function that you're aware of? You say you   16:02:55
4 haven't done that analysis.   16:02:55
5   A   Not that I know of. Oh, I didn't say I   16:02:56
6 haven't done that. I mean, I said I haven't done   16:02:59
7 the exhaustive search of what you could do. But I   16:03:01
8 absolutely, throughout my career, did this. And you   16:03:04
9 always look to mixers. In my -- again, in the   16:03:07
10 commercial and industrial applications related to   16:03:15
11 Zhang and certainly the '362.   16:03:18
12   Q   Okay. Well, looking at paragraph 374 of   16:03:23
13 your report, do you see that? I think that's a   16:03:31
14 summary of your opinions. Invalidity over Zhang or   16:03:37
15 Zhang in combination with Favrat; do you see that?   16:03:40
16   A   37 what?   16:03:46
17   Q   374 of your report on page 111.   16:03:59
18   A   Okay. I'm there. That's 374 is the   16:03:59
19 beginning of the section.   16:04:05
20   Q   Yeah, right. I think it's just a summary   16:04:06
21 of what you opine, ultimately.   16:04:08
22   A   Yeah.   16:04:17
23   Q   ==Am I correct you don't offer an opinion in==   16:04:17
24 ==which you combine Zhang with the Li reference in==   16:04:19
25 ==terms of an obviousness combination?==   16:04:23

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1   A   That's correct. Li was brought in as   16:04:38
2 support for the use of a mixer. Just that it's   16:04:40
3 obvious to a person of ordinary skill in the art. I 16:04:44
4 don't think any of my headings in my report -- but   16:04:47
5 I'll double-check that. Let me just -- before I   16:04:52
6 give you, quote/unquote, my final answer.   16:04:55
7   Well, I state that in my opinion claims 11   16:05:33
8 and 12 -- in my paragraph 374 -- are invalid --   16:05:36
9 claims 11 and 12 of the '362 patent are invalid over   16:05:41
10 US Patent No. -- and I'll shorten it -- '372 Zhang   16:05:47
11 alone, or Zhang in combination with US Patent No.   16:05:52
12 '792 Favrat.   16:05:54
13   It's also my opinion claims 11 and 12 of   16:06:01
14 the '362 are invalid over US Patent '901, Dauphinee.   16:06:03
15 That's my opinion.   16:06:10
16   Q   Right. So I guess not to be -- put too   16:06:11
17 fine a point on it, but you don't offer an opinion   16:06:15
18 that the claims -- claims 11 and 12 of '362 patent   16:06:18
19 are obvious when combining Zhang with Li, correct?   16:06:23
20   A   I think Li -- Li was used -- and if you'll   16:06:46
21 look at the last sentence in 393, Li was used as   16:06:52
22 support to, quote/unquote, and I quote from my   16:06:56
23 report, confirms my understanding that Zhang's   16:06:58
24 frequency block converter are mixers or mixer   16:07:01
25 modules within the meaning of the '362 patent.   16:07:05

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1 That's how Li was used.   16:07:08
2   Q   Right. You're not offering an opinion that   16:07:16
3 one of ordinary skill-in-the-art would combine Zhang 16:07:18
4 and Li to find that the '362 claims 11 and 12 are   16:07:22
5 obvious, right?   16:07:26
6   A   I don't think that's anywhere in my report.   16:07:27
7 I said how I used Li. Li confirms my understanding.   16:07:30
8   Q   Okay. Thank you. If you could look at   16:07:42
9 paragraph 389. I think we already talked about this 16:07:44
10 a little bit. And there there's the reference that   16:07:47
11 you talked about, the undesired -- we talked earlier 16:07:51
12 about undesired channels; do you remember that?   16:07:52
13   A   We did.   16:07:55
14   Q   Right. Can you explain to me in there   16:07:58
15 where it is that Zhang discloses undesired channels   16:08:01
16 explicitly?   16:08:05
17   A   Sure. In 389 it says selects one or   16:08:07
18 more -- this is the quote from Zhang. Selects one   16:08:28
19 or more of the RF channels, D1 to DM, from one or   16:08:34
20 more of the digital RF channels, C1 through CN. So   16:08:38
21 there's a larger grouping and a smaller grouping and 16:08:47
22 there's a selection process.   16:08:50
23   Q   Yeah. But why does that explicitly mean   16:08:55
24 that they are undesired channels? How does that   16:08:57
25 follow?   16:09:01

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1   A   All right. Give me one second, please.   16:09:01
2   Q   Sure.   16:09:04
3   A   Well, paragraph 6 of Zhang, lines 18   16:10:46
4 through 34, you know, give more color. And there's   16:10:51
5 even -- it gets pretty specific about -- let's just   16:10:56
6 say there's 35 separate RF channels, C1 to C35. I'm 16:10:59
7 reading from line 29 of column 6.   16:11:08
8   For example, in figure 6 there are 35   16:11:11
9 separate RF channels, C1 to C35. Of those channels, 16:11:15
10 20 RF channels, D1 to D20, are selected. Those 20   16:11:19
11 selected RF channels are sent to a set of   16:11:25
12 demodulators for demodulation.   16:11:29
13   I think a person of ordinary   16:11:33
14 skill-in-the-art would understand the ones you   16:11:35
15 selected were the desired ones and the other ones   16:11:36
16 were undesired. You didn't need them.   16:11:40
17   Q   Well, wouldn't it be possible that you   16:11:42
18 wouldn't have enough -- there would be some order   16:11:44
19 where you would have less demodulators than you   16:11:46
20 would have channels?   16:11:49
21   A   Let me just go to my report. All right. I   16:12:02
22 just need a minute here. I'm going back to the   16:12:39
23 '362. In the '362 it almost is a perfect map   16:12:42
24 between Zhang and the '362.   16:13:13
25   If you look it says, line 29, column 1,   16:13:16

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1 Because the swath of channels is not contiguous,   16:13:21
2 this swath includes the desired channels as well as   16:13:24
3 the undesired channels. The demodulator employs a   16:13:29
4 high speed data converter to capture the swath of   16:13:32
5 desired and undesired channels in the digital domain 16:13:34
6 and subsequently filters out the desired channels.   16:13:37
7   That's what Zhang does. It's almost a   16:13:41
8 direct --   16:13:47
9   Q   Where does it say that in Zhang?   16:13:48
10   A   Oh, I was just there. I'll go back to   16:13:50
11 Zhang. Yeah. It was column 6. It says, line 31   16:13:53
12 through 34, of those RF channels, 20 RF channels, D1 16:14:30
13 to D20, are selected. Those selected channels are   16:14:35
14 sent to a set of demodulators. That's exact --   16:14:38
15 that's not exactly, but that's almost directly what   16:14:41
16 '362 says.   16:14:46
17   Q   Right. There's two pieces in there. It   16:14:53
18 doesn't say that there's -- that the undesired --   16:14:55
19 that nothing is done with the other channels, right? 16:14:57
20 That those other channels are undesired, correct?   16:15:01
21 Anywhere in Zhang.   16:15:03
22   A   Well --   16:15:06
23   Q   You're inferring that, correct?   16:15:07
24   A   Zhang -- I did a search on. My favorite   16:15:10
25 thing, just do the search on Zhang. And I think if   16:15:16

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1        MR. BENYACAR:  Thank you, Dr. Goldberg.      17:22:42
2        THE WITNESS:  Thank you.                     17:22:44
3        MR. SHIMOTA:  Thank you.                     17:22:45
4        THE VIDEOGRAPHER:  This concludes today's    17:22:46
5     video-recorded deposition of Dr. Steven         17:22:47
6     Goldberg.  We're off the record at 5:22 p.m.    17:22:50
7     The number of media used is seven and will be   17:22:51
8     retained by Veritext.  Thank you.               17:22:56
9        (Proceedings ended at 5:23 p.m.)
10        (Signature reserved.)
11
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1           REPORTER'S CERTIFICATE
2     I, VICTORIA A. GUERRERO, California Certified Shorthand
3  Reporter, Registered Diplomate Reporter, Registered Merit
4  Reporter, Certified Realtime Reporter, do hereby certify
5  that, pursuant to Federal Rules of Civil Procedure, STEVEN
6  GOLDBERG, Ph.D.EE appeared remotely before me at the time
7  and place mentioned in the caption herein; that the witness
8  was, by me, first duly sworn/affirmed under oath and
9  examined upon oral interrogatories propounded by counsel;
10     that said examination together with the testimony of
11  said witness was taken down by me in stenotype and
12  transcribed through computer-aided transcription; I further
13  certify that I am not a relative or employee of any attorney
14  of the parties, nor financially interested in the action;
15     and the foregoing transcript, pages 1 through 262,
16  review requested by the witness or a party, constitutes a
17  full, true, and correct record of such testimony adduced and
18  oral proceedings had and of the whole thereof.
19     WITNESS MY HAND AND DIGITAL SIGNATURE this Thursday,
20  August 24, 2023.
21
22
23  Victoria A. Guerrero, CSR, RDR, RMR, CRR
    Oregon CSR No. 14-0428   (exp. 9-30-2024)
24  Washington CCR No. 3293  (exp. 3-15-2024)
    California CSR No. 8370  (exp. 3-15-2024)
25  Hawaii CSR No. 490     (exp. 12-31-2023)
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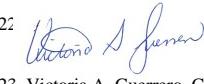
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1             Veritext Legal Solutions
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2                  Suite 1820
               Cleveland, Ohio 44114
3             Phone: 216-523-1313
4
   August 29, 2023
5
   To: David Benyacar, Esq.
6
   Case Name: Entropic Communications, LLC v. Charter Communications,
7  Inc., et al
8  Veritext Reference Number: 6060655
9  Witness:  Steven Goldberg, Ph.D.EE   Deposition Date:  8/22/2023
10
   Dear Sir/Madam:
11
12 Enclosed please find a deposition transcript.  Please have the witness
13 review the transcript and note any changes or corrections on the
14 included errata sheet, indicating the page, line number, change, and
15 the reason for the change.  Have the witness' signature notarized and
16 forward the completed page(s) back to us at the Production address
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   above, or email to production-midwest@veritext.com.
18
19 If the errata is not returned within thirty days of your receipt of
20 this letter, the reading and signing will be deemed waived.
21
   Sincerely,
22
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25 NO NOTARY REQUIRED IN CA
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1           DEPOSITION REVIEW
            CERTIFICATION OF WITNESS
2
      ASSIGNMENT REFERENCE NO: 6060655
3     CASE NAME: Entropic Communications, LLC v. Charter
   Communications, Inc., et al
      DATE OF DEPOSITION: 8/22/2023
4     WITNESS' NAME: Steven Goldberg, Ph.D.EE
5     In accordance with the Rules of Civil
   Procedure, I have read the entire transcript of
6  my testimony or it has been read to me.
7     I have made no changes to the testimony
   as transcribed by the court reporter.
8
   _____   _____
9  Date            Steven Goldberg, Ph.D.EE
10    Sworn to and subscribed before me, a
   Notary Public in and for the State and County,
11 the referenced witness did personally appear
   and acknowledge that:
12
      They have read the transcript;
13    They signed the foregoing Sworn
         Statement; and
14    Their execution of this Statement is of
         their free act and deed.
15
      I have affixed my name and official seal
16
   this _____ day of_____, 20____.
17
      _____
18    Notary Public
19    _____
      Commission Expiration Date
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21
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23
24
25
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